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LABCAIRE
For Tomorrow's Environment

Aura

Filtration Fume Cupboards

All Models: AU-250, AU-550, AU-750, AU-751 - E, ES & EH

aura

Operators Manual

Issue 06 – August 2010

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Registered in England No: 2695450

CE Marking certifies that this equipment conforms to the following EEC directives: -
Low Voltage Equipment – 72/23/EEC & 93/68 EEC
Electromagnetic Compatibility – 89/336/EEC

Certificate No: 0954499

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INTRODUCTION

The Aura range of filtration fume cupboards are designed for recirculatory use and do not require connection to ducting.

The cabinets are suitable for laboratory use and a range of filters are available for different applications. It is necessary before use to perform a hazard analysis to ensure the correct filters are selected and the cabinet is used in a safe manner.

E MODEL:

The filtration system has a pre-filter, which removes particulates to 0.5 microns. If toxic particulates are to be used in the cabinet, the Hepa filter exhaust model should be selected.

The main filter above the pre-filter is accessible through the front of the head unit and a wide variation of activated carbon filters are available for different purposes - Please see Section 6.

ES MODEL:

This model has an extra Safety Carbon Exhaust Filter fitted and there are different filters are available for different chemicals. The filter selected should be the same grade as the main filter.

EH MODEL:

This model has a Single Exhaust HEPA Filter fitted as well as a Pre-filter and a main carbon filter.
The exhaust filter is fitted at the factory and removes particulates to 0.3 microns.

USEAGE

The correct filters must be fitted and tested before use and the cabinet sited in a suitable position away from other airflow's.

The cabinet is designed for use with the hinged glazing in the closed position. This ensures the inward airflow meets the requirements of BS7258 for Ducted Fume Cupboards and BS7989:2001 for Filtration Fume Cupboards.

During use the pre-filter will block and should be changed when the low airflow alarm is activated.

The cupboards are fitted with the Eversafe™ electronic control panel, which monitors: -

(A) Airflow
(B) Filter saturation (Hydrocarbons)

Alarms are activated if performance approaches unsatisfactory levels.

The cabinet is for personal safety and under C.O.S.H.H regulations the cabinet must be inspected and tested at least every 14 months.

SPECIFICATION

The cabinet is constructed of Zintec coated steel epoxy powder, coated for maximum corrosion protection. All glazing is from 6mm clear acrylic with polished edges.

This cabinet is for mounting on a bench (or optional stand), and is supplied with a fiberglass reinforced, plastic spillage tray. Trays with drip cups or different materials are available if required.

Face Velocity	> 0.5m/sec
Lighting	> 1000 Lux at Work Surface
Noise	< 58 DB (A)
Airflow	
250 Models	> 250 m3/HR
550 Models	> 550 m3/HR
750 Models	> 750 m3/HR

Carbon Filters - Typical efficiencies are in excess of 99%. However some chemicals are not well absorbed and a hazard analysis is required before use.

If assistance for filter selection Is required call Labcaire on 01275 793000.

HEPA Filters - > 99.997% efficient against 0.3 micron particles.

INSTALLATION

SITING OF CABINET:

The location of the fume cupboard is important and the general principles are:-

a) Away from draughts from doors, open windows, ventilation outlets etc.

b) Not adjacent to sidewalls, walkways, in small rooms or other restricted areas.

c) Not impeding any Fire Safety exit

d) There is a general recommendation that chemical laboratories have a minimum of ten air changes per hour from a non-recirculatory ventilation system.

INSTALLATION:

The cupboard will be supplied in sections as follows:

a) Head section with power lead.
The lead will have an electrical plug fitted with the correct fuse. Plugs for different countries can be supplied. (Check Polarity)

b) Base section including tray.

c) Filters - The pre-filter will already be fitted.
Main Filters
(ES and EH Models will be supplied with the exhaust filter already fitted)

d) Test Certificate.

e) Operators Manual.

ASSEMBLY:

a) Place the base unit onto the bench/stand.

b) Connect the power lead onto the top of the unit. Lift the head section on top of the base and ensure the feet on the head unit locate inside the base section. This will need at least two people.

c) The airflow sensor is fitted in the centre front of the cupboard. The sensor connector cable must be plugged into the socket in the head unit. This is inside the cupboard in the front top right hand corner.

d) There is a mains power isolating switch adjacent to the mains inlet cable this is normally in the ON position.

e) Switch power switch on the front of the cabinet to STANDBY and then plug into a 13amp electrical socket.

f) To assemble filters please refer to Section 6.

SERVICES:

Water, drip cup, gas and other services may be specified and will normally be fitted on installation.

Gas services MUST be checked by a registered gas engineer before use.

NOTE

When the cabinet is first installed the gas sensitivity should be set to A (>200ppm OEL/TLV) for the first 100 hours to stabilise.
The sensitivity can then be set to B or C if required.

CONTROL SYSTEM

The mains isolation switch is adjacent to the mains inlet cable on top of the cabinet. This is normally left in the on position.
The cupboard is switched to standby on the front control panel when not in use and a red LED displays the standby status.

CONTROL PANEL FEATURES

LCD DISPLAY

There is a LCD display, which is used for different purposes and is driven by a menu system. The system is used for: -

a) Filtration level bar graph is displayed on top line in normal use

b) Filter type fitted is displayed while in normal use

c) Actual Airflow on front face is displayed in normal use

d) Display of data stored in the microprocessor e.g. hour's run-time, filter type etc

e) Display of alarms

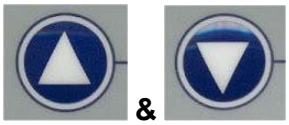
f) Selection of filter type, toxic class etc

g) For calibration of sensors

CONTROL PANEL TOUCH BUTTONS :

STANDBY:A power ON switch on the control panel allows the cupboard to be left in a standby status when not in use and a red LED displays this status.

FAN ON/OFF MEMBRANE SWITCH: The fan can be switched off during normal running, the alarm for low airflow will automatically sound.



ARROWS MEMBRANE SWITCHES: These arrows are used for selecting data in menu mode.

LIGHT ON/OFF: This switch allows the lights to be switched off during normal running.

ALARM MUTE: If an alarm is activated the alarm mute will switch off the audible alarm - the alarm is automatically reset after 2 minutes.

MENU: Pressing the MENU button when in normal running accesses the SET UP MENU Screen which allows the basic data to be entered into the microprocessor. It is also used as the acknowledge and exit button on all screens.

SET UP MENU – Accessed by pressing MENU when cabinet in normal running.
This will allow the basic operating parameters to be set up: -

```
FILTER TYPE      ◄
ALARM SET TIME
ELAPSED TIME
TOXIC CLASS
INFORMATION
EXIT
```

Use the UP/DOWN buttons to move the cursor to the required parameter and press menu to access the data screen.

FILTER TYPE

```
AC        ALAC     FORM
AMN       SUL      AC-R
AC-HG     ACI      CYND
ED        MCH      CUST
HEPA      ETHE

PRESS 'MENU' TO SELECT
```

FILTER ALARM SET TIME

```
ENTER ALARM TIME

   100 HOURS
   500 HOURS
  1000 HOURS

PRESS 'MENU' TO EXIT
```

ELAPSED TIME

```
HOURS OF FILTER USE

     0049.5
TO RESET - SEE MANUAL
PRESS MENU TO EXIT
```

TOXIC CLASS

```
PLEASE SELECT THE
REQUIRED TOXIC CLASS

   A      ◄
   B
   C
PRESS 'MENU' TO EXIT
```

INFORMATION

```
PRODUCT TYPE
AURA

TOXIC CLASS  A
FILTER TYPE:  AC

LABCAIRE SERVICE
TEL. 01275 7930000
```

On each screen if required the UP/DOWN buttons are used to move the cursor to the required parameter and the MENU button is then used to set the parameter and exit the screen.

FILTER ALARM SET TIME

It is necessary to set a number of hours to indicate when the filters require checking. It is advisable to set the time allowing for the anticipated use of the cabinet, taking into account the levels of chemicals in use and the toxicity of those chemicals. Consult Labcaire if further information is required.

ELAPSED TIME

HOURS OF FILTER USE 0049.5 TO RESET - SEE MANUAL PRESS MENU TO EXIT

This screen displays the time the filter has been in use and relates to the Filter alarm set time. To reset the elapsed time once the alarm has sounded and the filters have been changed Press the MUTE button whilst this screen is displayed.

INFORMATION

This screen displays the filter type that has been installed in the unit and the Toxic Class criteria for the filter saturation alarm.

CONTROL PANEL OPERATION

NORMAL USE

When the power on button on the control panel is pressed the unit switches on and the fan and lights automatically start up. The control panel displays the AURA logo for 5 secs and then an information screen, which displays the filter currently fitted in the unit and the toxic class for the chemicals to be used.

```
PRODUCT TYPE
AURA

TOXIC CLASS  A
FILTER TYPE:  AC

LABCAIRE SERVICE
TEL. 01275 7930000
```

The display then automatically displays the query screen

```
IS THE CORRECT FILTER
FITTED FOR YOUR USE

YES ◄
NO

PRESS 'MENU' TO
CONTINUE
```

If filter type displayed on information screen correct, leave cursor on YES and press MENU. Screen will change to the normal running screen as below.
When installing a new unit or the filter has been changed, use the arrow UP/DOWN to move the cursor to the NO position and press MENU.
This now allows the filter installed in the unit to be selected.

```
 AC        ALAC     FORM
AMN        SUL      AC-R
AC-HG      ACI      CYND
ED         MCH      CUST
HEPA       ETHE

PRESS 'MENU' TO SELECT
```

Again use the UP/DOWN buttons to move the cursor to the correct filter type and press menu to select and enter the filter type.
The unit will then automatically change to the **normal running screen**.

```
FILTRATION LEVEL
■■■■■■■■■■

FILTER TYPE:  AC

AIRFLOW   0.55  M/S
```

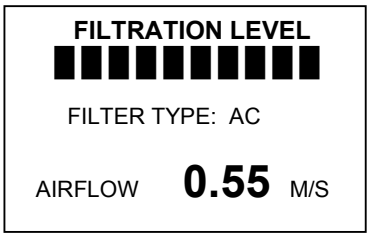
FILTRATION LEVEL:

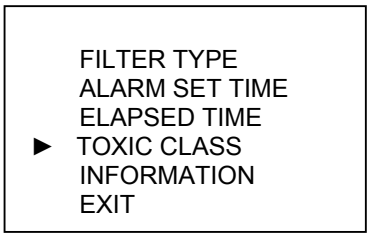
A bar graph on the top line of the LCD indicates the level of hydrocarbons in the exhaust air in normal use. The bar graph displays all the sections black when no fumes are detected. As the filter becomes saturated and chemical breakthrough starts the no. of black sections will decrease until the alarm sounds.

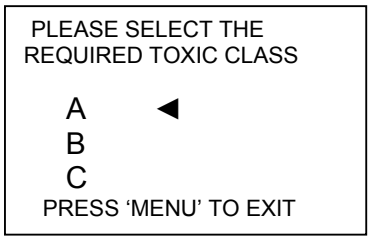
The sensitivity of the display can be varied by selection of one of three scales for the toxic class of the chemicals in use in the unit: -

(A) > 200ppm TLV/OEL
(B) 0 - 200ppm TLV/OEL
(C) 0 - 50ppm TLV/OEL

The selection is accessed through the SET UP MENU SCREEN. If more than one chemical is used the lowest TLV/OEL is used to select toxic scale.







On the normal running screen press MENU to display the SET UP MENU. Move the cursor with the UP/DOWN buttons and press menu to select the Toxic Class screen. Move the cursor UP/DOWN to select the toxic class required, and then MENU to select and exit.

AIRFLOW:

The airflow shown on the liquid crystal display indicates the true airspeed through the sash.

The sensor is fitted in the center front of the cupboard underneath the head unit. This sensor is delicate and must not be touched.

The sensor is temperature compensated for use between $17^{O}C$ and $25^{O}C$ - normal laboratory temperatures.

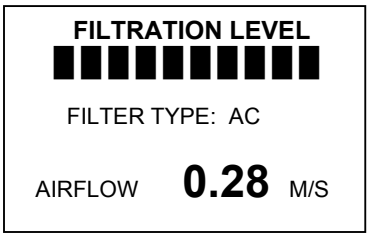
The sensor display has a control loop, which will gradually increase or decrease the fan speed to maintain the set airflow speed. The unit will automatically display the red LED warning light whilst the fan is running up and the airflow is below the alarm point of 0.3m/s.

The airspeed will be controlled automatically to achieve the set airspeed.

ALARMS:

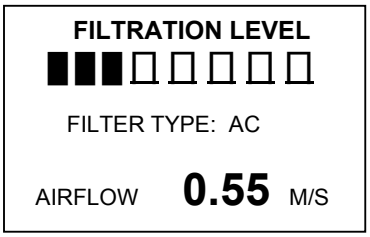
The control system has a number of alarms to ensure the cabinet is operating correctly:-

Low airflow alarms



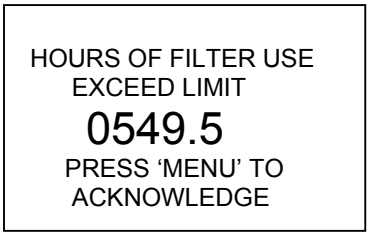
When the airflow falls below 0.3m/s the red LED above the mute button will flash and the alarm will sound.
This alarm normally signals that the pre filter requires changing.
It may also sound if the selected airflow is close to 0.3m/s and turbulence is making the face velocity unstable.

Filtration level



The alarm will indicate when hydrocarbon fumes in the exhaust gas have reached an unacceptable level.
The experiment should be terminated as soon as practicable when the alarm sounds.
The alarm can be due to a number of factors - excessive challenge to filter/filters approaching end of life etc.

Alarm hours



The alarm will be displayed when the preset filter use time limit has been exceeded.
The filter should be changed and the hours use alarm reset.

OPERATION AND SAFE USE

SITING OF FUME CUPBOARD:

The cupboard should be sited in a safe position and not used if cross draughts are present.

DOOR ARRANGEMENT:

The doors are hinged and can be folded up for cleaning or assembling apparatus. The catch on the right hand lower door will engage in the catch on the head unit to secure in the open position.

The doors MUST be closed when chemicals are being used in the cabinet.

GOOD PRACTICE FOR USE OF FUME CUPBOARD:

A. Remove unwanted apparatus etc. from the fume cupboard.

B. Switch cabinet on and verify ventilation system is functioning.

C. Prior to release of hazardous gases or vapors, as far as possible, install apparatus and check service connections for leaks etc.

D. Wear eye protection whilst using the cabinet.

E. Acids, if used, should be cold.

F. Cover beakers as much as possible to extend filter life.

G. Ensure flaps are fully down before releasing hazardous gases or vapors.

H. A Bunsen burner should not be placed within 150mm of the sides or back of the cabinet and the flame kept below 100mm high.

I. The operator should move his arms carefully so as not to draw fumes out of the cabinet.

J. The fume cupboard is designed for normal experimental release rates and should not be used for boiling off large quantities of acids or solvents.

K. The cabinet should not be switched off at the end of an experiment until the cabinet has purged itself of fumes.

L. Please consult Labcaire before using cabinet for new applications.

SPILLAGES:

Spillages must be mopped up immediately with absorbent granules.

Note - Absorbent cloths should not be used as they can increase the evaporation rate of the solvents.

The fiberglass tray is resistant to most chemicals but spillages should be quickly dealt with to avoid staining.

INITIAL OPERATION:

The unit has been calibrated in the factory prior to delivery.

After installation of the filters, switch the unit on.

The information screen will briefly be displayed and the filter type is displayed on this screen. The screen then changes and asks 'Is the correct filter fitted for your use'
If the filter type displayed is the same as the one just installed select YES and the unit will automatically go to normal running. The fan and airflow take about 2 minutes to stabilize. If no alarms are showing the unit is now ready to use.

PRODUCT TYPE AURA TOXIC CLASS A FILTER TYPE: AC LABCAIRE SERVICE TEL. 01275 7930000	IS THE CORRECT FILTER FITTED FOR YOUR USE **YES** ◄ **NO** PRESS 'MENU' TO CONTINUE	**FILTRATION LEVEL** ▮▮▮▮▮▮▮▮▮▮ FILTER TYPE: AC AIRFLOW **0.55** M/S

If the filter just installed is different, move the cursor to NO and press MENU. From the filter type screen select the correct filter and then the unit will automatically amend the filter type and go to normal running. The fan and airflow take about 2 minutes to stabilize. If no alarms are showing the unit is now ready to use.

IS THE CORRECT FILTER FITTED FOR YOUR USE **YES** **NO** ◄ PRESS 'MENU' TO CONTINUE	AC ALAC FORM AMN SUL AC-R AC-HG ACI CYND ED MCH CUST HEPA ETHE PRESS 'MENU' TO SELECT	**FILTRATION LEVEL** ▮▮▮▮▮▮▮▮▮▮ FILTER TYPE: AC AIRFLOW **0.55** M/S

Further details on the operation of the control panel and settings are in the section on Control Panel Operation.
If further data on filters is required please consult Labcaire

FILTERS

The head section contains a pre-filter, a main filter with a 'Filtrak' filter patented sealing mechanism. The ES and EH models have a third filter stage at the exhaust on the top of the cabinet.

PARTICULATE PRE-FILTER:

The particulate pre-filter (white fibrous cloth) is mounted underneath the main filter and is accessed from inside the cabinet.

This filter removes dust, aerosols and smoke although small particles below 0.5 micron will pass through. This prevents these contaminants from passing back into the laboratory as well as preventing the blockage of the main filter.

To check or replace:

A. Open the door and secure onto the clip on the head unit.
B. Start the fume cabinet.

C. Put on plastic gloves. Inside the cabinet at the top front there is a plastic catch, which can be rotated to release the pre-filter frame. When the catch is released, the pre-filter hinges downwards to the limit of the strap. The pre-filter can now be removed, checked or replaced as required.

D. After fitting the pre-filter into the frame, the frame can be lifted back into position and secured with the catch.

E. Inside the cabinet, place used Pre-filters inside plastic bag and securely seal.

F. Dispose of Pre-filter by incinerated waste.

MAIN FILTER - ACTIVATED CARBON:

The normal filter is of large capacity and will retain and absorb chemicals.

Activated Carbon without any impregnates will give good absorption of hydrocarbons. The efficiency and life of the carbon filter can be improved by impregnating the filter with chemicals, which will react with the pollutant and thus be retained in the filter.

Many impregnates are available that would be suitable for use with various chemicals and Labcaire should be contacted to discuss the application for specification of the optimum filter(s).

The main filter(s) are accessed through the front of the head section by turning the vice latches 180 degrees and lifting the front cover until it is supported on the automatic strut (Lifting the cover upwards again will release the strut).

CAUTION

a) Used filters should only be handled using rubber/plastic gloves.

b) Used filters should be sealed inside a polythene bag for disposal. Some grades of filter will require disposal as hazardous waste.

EXHAUST FILTER - (ES & EH MODELS):

The exhaust filter is mounted on top of the cabinet and in the case of the ES models, the same grade of filter should be specified as main filter.

HEPA filters are fitted to the EH models and are 99.997% efficient against 0.3 micron particles.

The exhaust filters are clamped in place using screws on top of the cabinet. The exhaust filter seals are under negative pressure to eliminate potential leaks.

FILTER REMOVAL:

The Aura models have a patented 'Filtrak' heavy duty filter clamping mechanism, which allows for easy assembly of filters and a positive clamp force on the filter seals.

The cams are rotated through 90 degrees to lift the 'H' section extrusions to the upper position. (The 550 and 750 models have two main filters and a 3 lever 'Filtrak' mechanism).

a) Turn vice latches on front cover of head through 180° to release.
b) Lift front cover enough to secure on automatic strut.
c) Release 'Filtrak' clamp mechanism by rotating levers through 90°.
d) Using rubber gloves, remove the old filter by sliding forwards to clear the runners.
e) Place the used filter into a polythene bag, seal and identify for disposal.

FILTER FITTING:

a) The main filter(s) should be checked for identification as suitable for intended use.

b) Unwrap the filter and check the filter seal is in good condition, ie. flat and no gaps. A smear of silicone grease or similar on the seal will aid filter sealing.

c) Lift the filter, with rails on top, to slide into the runners on the 'H' section of the 'Filtrak' mechanism, push fully back.

(Repeat for second main filter on 550 and 750 models

d) Rotate cam levers through 90° to lower and clamp filters into position.

e) Record date of installation of filter onto the filter label for future reference.

f) Check filter type on the normal running screen and change if necessary.

Before Use: The filter should be checked with a chemical challenge before use. Non-impregnated Activated Carbon filters can be checked with Trichloroethylene and the appropriate gas detector tube. The filter efficiency should be greater than 99%.

MONITORING

This fume cupboard is an appliance that is powered by mains electricity and must meet the requirements of the Electricity at Work Regulations 1989. As for other such appliances, the correct fuse should be fitted to the mains plug and this and other exposed parts of the electrical system should be examined frequently for obvious damage. There should be regular formal inspections, including earth bonding and insulation testing.

It is the requirement of COSHH regulations that this fume cupboard should be tested every 14 months. In particular, the face velocity and filter efficiency need checking. (The calibration of the airflow monitor and Hydrocarbon sensor should be checked).

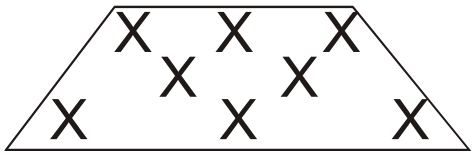
(If there are gas and water supplies, these should be checked, particularly the hoses and connectors; so also should the drainage system).

Puricore International has a UK Service Department and can carry out the testing. Please contact Puricore International for details of the contracts available on 01275 793000. The notes below are for the benefit of the customers who wish to do their own.

The face velocity should be checked with a vane anemometer (a 100mm diameter vane averages the airflow over a suitable area).

A gas detection kit consists of a detector tube used with a special hand pump, which draws a measured volume of air through the tube. The length of the colour change within the tube indicates the concentration of the gas tested. This equipment is available from Puricore International. Use gas detector tubes for the chemical in use.

FACE VELOCITY:
Measure the face velocity in a grid pattern, similar to the diagram.



The average velocity should be greater than 0.5 m/sec and the variation less than +/- 20%

CHEMICAL TESTING:

The effectiveness of the carbon filter to absorb chemicals is tested by releasing the correct chemical as a challenge and monitoring the filter an exhaust concentration. The filter efficiency should be in excess of 95% and be below the occupational exposure limits of the chemical.

For further information on the correct procedure for a particular application, please consult Puricore International on 01275 793000.

SERVICING

An annual visit by a service engineer is recommended, but testing every 14 months is mandatory under COSHH regulations.

PROCEDURE:

A. Replace pre-filter and check airflow.

B. Filter condition:- Check by chemical testing.

C. Electrical component and safety checks.

D. General condition of glazing, hinges etc.

E. Earth bonding of metal parts.

F. Examination of services if fitted.

G. Check calibration of airflow sensor and gas sensor.

H. Issuing of Test Certificate.

Puricore International have a national team of service engineers who can offer a comprehensive service at a competitive rate.

Free technical advice, by telephone, is available if required

(01275) 793000

MAINTENANCE

Warning -

The electrical components are mounted in the end module on the right hand side. Access is through the end cover using the special key supplied.

DANGER 240V - QUALIFIED ELECTRICIANS ONLY

LIGHTING:

The cabinets have fluorescent tubes at both sides of the cabinet. The left hand side light fitting is accessed inside the head unit. Remove filter(s) and remove access panel. The fluorescent tube on the right hand side is mounted inside the end module. ONE FUSE PROTECTS BOTH LIGHTS.

LOW AIRFLOW ALARM:

The performance of the low airflow alarm should be tested by checking the average face velocity of the cabinet with the display. The display should be ± 0.05 M/sec of the average velocity. It is possible to recalibrate the alarm. Contact Puricore International for full instructions.

GAS SENSOR ALARM:

The performance of the gas sensor can be checked by allowing Isopropanol or a similar solvent to bypass the filter. The alarm should activate. Contact Puricore International if further assistance is required.

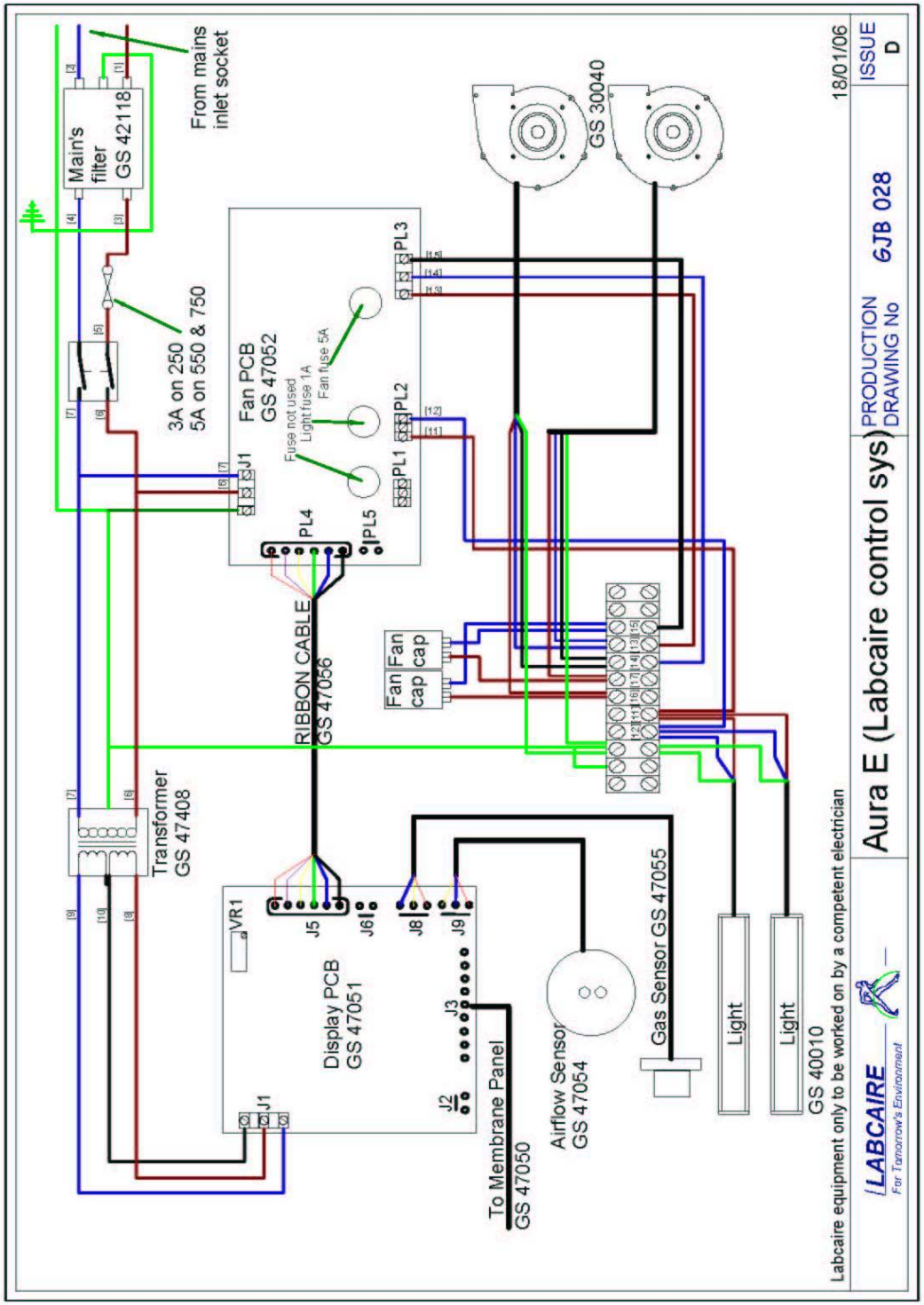
CABINET FUSE:

The cabinet fuse is 5 amp and is located at the top of the cabinet, adjacent to the mains inlet cable isolator switch.

TESTING:

The cabinet airflow and filtration efficiency should be tested at least every 14 months to comply with COSHH regulations.

ELECTRICAL WIRING SCHEMATIC



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